What is Claimed is:

1. A genetically modified astrocyte for gene therapy, said genetically modified astrocyte comprising:

one or more DNA sequences selected from the group consisting of DNA encoding a selectable marker, DNA encoding a poison pill, and DNA encoding a molecule useful for gene therapy; and

suitable regulatory elements for controlling expression of said one or more DNA sequences.

2. The genetically modified astrocyte of claim 1 wherein said selectable marker comprises neomycin resistance.

3. The genetically modified astrocyte of claim 1 wherein said selectable marker comprises methotrexate resistance.

4. The genetically modified astrocyte of claim 1 wherein said poison pill comprises herpes virus thymidine kinase.

5. The genetically modified astrocyte of claim 1 wherein expression of said DNA encoding said molecule useful for gene therapy results in the production of a protein.

6. The genetically modified astrocyte of claim 1 wherein expression of said DNA encoding said molecule useful for gene therapy results in the production of anti-sense RNA.

1   7.   The genetically modified astrocyte of claim
2 1 wherein expression of said DNA encoding said
3 molecule useful for gene therapy results in the
4 production of a ribozyme.

1   8.   The genetically modified astrocyte of claim
2 5 wherein said protein comprises a growth factor.

1   9.   The genetically modified astrocyte of claim
2 8 wherein said growth factor comprises a cytokine.

1   10.   The genetically modified astrocyte of claim
2 5 wherein said protein comprises tyrosine
3 hydroxylase.

1   11.   The genetically modified astrocyte of claim
2 1 wherein said suitable regulatory elements include a
3 regulatable promoter.

1   12.   The genetically modified astrocyte of claim
2 11 wherein said regulatable promoter comprises an
3 inducible promoter.

1   13.   The genetically modified astrocyte of claim
2 12 wherein said inducible promoter comprises a human
3 preproenkephalin promoter.

1   14.   The genetically modified astrocyte of claim
2 11 wherein said regulatable promoter comprises a
3 constitutive promoter.

1   15.   The genetically modified astrocyte of claim
2 1 wherein said suitable regulatory elements include
3 an astrocyte-specific promoter.

1   16. The genetically modified astrocyte of claim
2 15 wherein said astrocyte-specific promoter comprises
3 a promoter for glial fibrillary acidic protein.

1   17. An astrocyte cell line comprising the
2 genetically modified astrocyte of claim 1.

1   18. A plasmid for transfection of astrocytes
2 which plasmid comprises DNA encoding a molecule
3 useful for gene therapy and suitable regulatory
4 elements for controlling expression of said molecule
5 useful for gene therapy.

1   19. A plasmid for transfection of astrocytes
2 which plasmid comprises DNA encoding a selectable
3 marker and suitable regulatory elements for
4 controlling expression of said selectable marker.

1   20. The plasmid of claim 19 further comprising
2 DNA encoding a poison pill and further suitable
3 regulatory elements for controlling expression of
4 said poison pill.

1   21. A plasmid for transfection of astrocytes
2 which plasmid comprises DNA encoding a poison pill
3 and suitable regulatory elements for controlling
4 expression of said poison pill.

1   22. An astrocyte stably transfected with one or
2 more plasmids, said one or more plasmids selected
3 from the group consisting of:
4   a plasmid comprising DNA encoding a molecule
5 useful for gene therapy and suitable regulatory
6 elements for controlling expression of said molecule
7 useful for gene therapy;

8 a plasmid comprising DNA encoding a selectable
9 marker and suitable regulatory elements for
10 controlling expression of said selectable marker;
11 a plasmid comprising DNA encoding a selectable
12 marker and suitable regulatory elements for
13 controlling expression of said selectable marker, and
14 further comprising DNA encoding a poison pill and
15 further suitable regulatory elements for controlling
16 expression of said poison pill; and
17 a plasmid comprising DNA encoding a poison pill
18 and suitable regulatory elements for controlling
19 expression of said poison pill.

1 23. A method of stably transfecting primary
2 cells, said method comprising stably transfecting
3 said primary cells using non-viral transfection
4 methods.

1 24. The method of claim 23 wherein said non-
2 viral transfection method comprises chemical
3 transfection.

1 25. The method of claim 24 wherein said
2 chemical transfection comprises stable calcium
3 phosphate transfection.

1 26. The method of claim 23 wherein said non-
2 viral transfections method comprises electroporation.

1 27. The method of claim 23 wherein said primary
2 cells comprise astrocytes.

1. 28 A method for gene therapy in the central
2 nervous system of a subject which method comprises:

3   genetically modifying primary cells to include
4   DNA encoding a molecule useful for gene therapy in
5   the central nervous system;

6   transplanting said genetically modified primary
7   cells into the central nervous system of a subject;
8   and

9   expressing said DNA encoding said molecule,
10   thereby producing said molecule for gene therapy in
11   the central nervous system of the subject.

1   29.   The method of claim 28 wherein said primary
2   cells comprise astrocytes.

1   30.   The method of claim 29 wherein said
2   astrocytes are genetically modified by a non-viral
3   transfection method.

1   31.   The method of claim 30 wherein said non-
2   viral transfection method comprises chemical
3   transfection.

1   32.   The method of claim 31 wherein said
2   chemical transfection comprises stable calcium
3   phosphate transfection.

1   33.   The method of claim 28 wherein said
2   expression of said DNA is controlled by a regulatable
3   promoter.

1   34.   The method of claim 33 wherein said
2   regulatable promoter is controlled pharmacologically.

1   35.   The method of claim 34 wherein said
2   pharmacologic control comprises utilizing
3   dopaminergic pathways.

1   36.   The method of claim 33 wherein said
2 regulatable promoter comprises an inducible promoter.

1   37.   The method of claim 33 wherein said
2 regulatable promoter comprises a constitutive
3 promoter.

1   38.   A method of maintaining and growing
2 astrocytes in culture, said method comprising:
3   growing first astrocytes with a liquid medium
4 overlying said first astrocytes so as to condition
5 said liquid medium;
6   removing said conditioned liquid medium; and
7   placing said removed conditioned liquid medium
8 over second astrocytes, said removed conditioned
9 liquid medium capable of maintaining and growing said
10 second astrocytes in culture.

1   39.   A method of selecting for astrocytes in a
2 mixed cell population, said method comprising:
3   stably transfecting a mixed cell population with
4 an astrocyte-specific plasmid, said astrocyte-
5 specific plasmid comprising DNA encoding a selectable
6 marker and suitable regulatory elements for
7 controlling expression of said selectable marker;
8   growing said transfected mixed cell population
9 under selective conditions, wherein said astrocyte-
10 specific promoter functions only in transfected
11 astrocytes present in said transfected mixed cell
12 population, such that only transfected astrocytes
13 present in said transfected mixed cell population can
14 be selected under said selective conditions using
15 said selectable marker under control of said
16 astrocyte-specific promoter; and

17   selecting said astrocytes from said mixed cell
18 population.

1   40.   The method of claim 39 wherein said
2 astrocyte-specific promoter comprises a promoter for
3 glial fibrillary acidic protein.

1   41.   The method of claim 39 wherein said
2 selective marker comprises neomycin resistance.

1   42.   The method of claim 39 wherein said
2 selective marker comprises methotrexate resistance.

1   43.   The method of claim 41 wherein said
2 selective conditions include exposing said
3 transfected mixed cell population to a neomycin
4 analogue.

1   44.   The method of claim 43 wherein said
2 neomycin analogue comprises G418.

1   45.   The method of claim 42 wherein said
2 selective conditions include exposing said
3 transfected mixed cell population to methotrexate.

1   46. A method of expressing a biologically
2 active molecule in an astrocyte of a subject which
3 method comprises:
4   obtaining a sample of an astrocyte;
5   stably inserting DNA encoding a biologically
6 active molecule into DNA of said astrocyte;
7   transplanting said resulting astrocyte into a
8 subject; and
9   expressing said biologically active molecule in
10 said astrocyte in said subject.

47. The method of claim 46 wherein said biologically active molecule is selected from the group consisting of a protein, antisense RNA, and a ribozyme.

48. The method of claim 46 wherein said sample of an astrocyte is obtained by removing astrocytes from said subject.

49. The method of claim 46 wherein said stable insertion comprises a non-viral transfection method.

50. The method of claim 46 wherein said expression of said biologically active molecule is under control of a regulatable promoter.

51. The method of claim 50 wherein said regulatable promoter comprises an inducible promoter.

52. The method of claim 50 wherein said regulatable promoter comprises a constitutive promoter.

53. A method of killing astrocytes in a subject, said method comprising:
    obtaining a sample of astrocytes;
    stably transfecting said astrocytes with a plasmid, said plasmid comprising DNA encoding a poison pill and suitable regulatory elements for controlling expression of said poison pill;
    transplanting said transfected astrocytes into a subject; and
    exposing said transplanted transfected astrocytes to a selective condition, wherein said suitable regulatory elements cause expression of said

13 DNA encoding said poison pill only in said
14 transplanted transfected astrocytes present in said
15 subject such that only said transplanted transfected
16 astrocytes present in said subject are killed by said
17 selective condition due to said expression of said
18 DNA encoding said poison pill under control of said
19 astrocyte-specific promoter.

1   54. The method of claim 53 wherein said poison
2   pill comprises herpse virus thymidine kinase.

1   55. The method of claim 54 wherein said
2   exposure to a selective condition comprises exposure
3   to a drug selected from the group consisting of
4   acyclovir and gancyclovir.

1   56. A method of preventing deterioration of
2   phenotypically normal cells in a subject which
3   comprises:
4   detecting a genotype indicative of an eventual
5   phenotypic abnormality in said normal cells;
6   treating said normal cell with the genetically
7   modified astrocyte of claim 1 so as to prevent said
8   phenotypic abnormality, said prevention being by
9   expression of said DNA encoding said molecule useful
10 for gene therapy by said genetically modified
11 astrocyte.

1   57. The method of claim 56 wherein said
2   phenotypic abnormality is indicative of Huntingtons
3   disease.

1   58. An astrocyte maintained and grown by the
2   method of claim 38.

1   59.   An astrocyte selected by the method of
2 claim 39.

1   60.   A kit for gene therapy comprising the
2 genetically modified astrocyte of claim 1.

1   61.   A kit for gene therapy comprising the
2 genetically modified astrocyte of claim 17.

1   62.   A kit for gene therapy comprising one or
2 more plasmids, said one or more plasmids selected
3 from the group consisting of:
4   a plasmid comprising DNA encoding a molecule
5 useful for gene therapy and suitable regulatory
6 elements for controlling expression of said molecule
7 useful for gene therapy;
8   a plasmid comprising DNA encoding a selectable
9 marker and suitable regulatory elements for
10 controlling expression of said selectable marker;
11   a plasmid comprising DNA encoding a selectable
12 marker and suitable regulatory elements for
13 controlling expression of said selectable marker, and
14 further comprising DNA encoding a poison pill and
15 further suitable regulatory elements for controlling
16 expression of said poison pill; and
17   a plasmid comprising DNA encoding a poison pill
18 and suitable regulatory elements for controlling
19 expression of said poison pill.

1   63.   The kit of claim 62 further comprising
2 astrocytes to be transfected with said one or more
3 plasmids.

1   64.   A kit for gene therapy comprising:

2 a plasmid vector having a polylinker site for
3 insertion of DNA encoding a gene of interest;
4 restriction enzymes for inserting said DNA at
5 said site; and
6 the astrocyte of claim 58 to be transfected by
7 the plasmid vector after insertion of said DNA into
8 said plasmid vector.